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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,098	04/16/2004	Takenobu Tani	61282-074	7726

7590 12/14/2006
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Washington, DC 20005-3096

EXAMINER

MITCHELL, JASON D

ART UNIT	PAPER NUMBER
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2193

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,098

Applicant(s)

TANI, TAKENOBU

Examiner

Jason Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/16/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-18 are pending in this application. Applicant's election of claims 5-18 is noted and appreciated, however Examiner requests that non-elected claims 1-4 be canceled in the response to this action.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. **Claims 5-13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

Claims 5-10 recite "An instruction converting apparatus" but do not define any structural interrelationships, which would permit the claimed functionality to be realized. Accordingly the claims recite only software per se. and are thus rejected as non-statutory.

Claims 5-7, "An instruction converting apparatus [that] applies an instruction related to a power control operation to the instruction program". As noted below it is unclear action 'applying an instruction' is intended to define. Resultantly, the claims lack a concrete and tangible result, and are rejected accordingly.

Claims 11-13 make a similar recitation, and are rejected for the same reasons.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5-7 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites "a power control instruction applier, which applies an instruction ... to the instruction program". It is not clear what specific action this 'applying' is intended to represent. Claim 11 makes a similar recitation.

For the purposes of this examination the claims will be treated as 'inserting' an instruction related to a power control operation.

6. Claims 7 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites, "a instruction-independent operation resource table ... which stores information as to whether or not each of the operation resources ... is actuated every instruction". Initially, it is assumed the claim is intended to be read, "is actuated by every instruction". However given this reading, it is unclear what is meant by "instruction-independent" when clearly the data in the table depends on the instructions. Claim 13 makes a similar recitation.

7. Claims 8-10 and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite reassembling the instruction program "in such a manner that an instruction section is made long". It is unclear whether or not this 'instruction section' is intended to represent the 'instruction section' detected during power control analysis, or some other 'instruction section'.

For the sake of examination the claims will be read as reciting "in such a manner that the instruction section is made long"

8. Claims 10 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite replacing "one instruction ... by a replaceable instruction having the same process result". It is unclear what is meant by a replaceable instruction.

For the purposes of examination, the claims will be read as reciting replacing "one instruction ... by another instruction having the same process result".

9. Claims 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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First it is unclear if these claims are intended to be presented as independent or dependent claims. Further Applicant has failed to clearly express the relationship between the claimed microprocessor and the 'instruction converting apparatus' (claim 17) or 'instruction converting method' (claim 18).

Double Patenting

10. Claims 5-6 and 11-12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7 and 10 of U.S. Patent No. 10/342,349 (the '349 application). Although the conflicting claims are not identical, they are not patentably distinct from each other because:

11. Each of Claims 5-6 and 11-12 would have been obvious over either of claims 7 or 10 of the '349 application.

Specifically, it would at least have been obvious to one of ordinary skill in the art, that the "power control information analysis unit" of the '349 application would analyze power control information extracted from the instructions in the instruction program it is analyzing.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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13. Claims 5, 7, 11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,790,877 to Nishiyama et al. (Nishiyama).

14. Regarding Claims 5 and 11: Nishiyama discloses an instruction converting apparatus for optimizing an instruction program so as to suitably execute the optimized instruction program by a predetermined microprocessor, comprising:

a power control manager, which extracts power control management information by referring to an instruction statement which is written in the instruction program (col. 5, lines 18-25 "the resource utilization table generation unit 501");

a power control information analyzer, which detects an operation resource based upon the power control management information extracted by the power control manager (col. 5, lines 32-44 "In a step 803, a section of cycle not used by the selected resource is determined by referring [to] the resourced utilization table"), the operation resource being not actuated for an instruction section having a predetermined length when the predetermined microprocessor is operated (col. 5, lines 32-44 "If the number of cycles not used by the resource is larger"); and

a power control instruction applier, which applies an instruction related to a power control operation to the instruction program based upon the detected result of the power control information analyzer (col. 5, lines 39-43 "In the step 805, an instruction to lower the clock frequency of the hardware resource is inserted").

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15. **Regarding Claims 7 and 13:** The rejections of claims 5 and 11 are incorporated respectively; further Nishiyama discloses:

a instruction-independent operation resource table storing unit, which stores information as to whether or not each of the operation resources of the predetermined microprocessor is actuated every instruction (col. 5, lines 18-25 "the resource utilization table 504");

wherein the power control information analyzer detects such an operation resource which is not actuated for the instruction section having the predetermined length when the predetermined microprocessor is operated based upon the information stored in the instruction-independent operation resource table storage unit (col. 5, lines 32-44 "In a step 803, a section of cycle not used by the selected resource is determined by referring [to] the resourced utilization table").

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. **Claims 6, 8-9, 12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,790,877 to Nishiyama et al. (Nishiyama) in view of US 5,453,401 to Lin (Lin).**

18. **Regarding Claims 6 and 12:** The rejections of claims 5 and 11 are incorporated respectively; further Nishiyama discloses:

the power control management information contains information for designating said predetermined length of the instruction section (col. 5, lines 34-37 "whether the number of cycles not used by the resource is larger than the number of cycles required to change the clock").

19. Nishiyama does not explicitly disclose the power control information analyzer changes the predetermined length of the instruction section based upon power control management information

20. Lin discloses changing the predetermined length of the instruction section based upon the power control management information (col. 4, lines 41-50 "Any suitable preselected amount of time can be used ... for turning on and for turning off the functional units").

21. It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of Nishiyama and Lin because one of ordinary skill in the art would have been motivated to further conserve power (Lin col. 3, lines 54-59 "the present invention results in a very significant reduction in power consumption").

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22. **Regarding Claims 8 and 14:** Nishiyama discloses an instruction converting apparatus for optimizing an instruction program so as to suitably execute the optimized instruction program by a predetermined microprocessor, comprising:

a power control analyzer, which detects an operation resource which is not actuated for an instruction section having a predetermined length when the predetermined microprocessor is operated (col. 5, lines 32-44 "In a step 803, a section of cycle not used by the selected resource is determined by referring [to] the resourced utilization table"); and

a power control instruction applier, which applies an instruction related to a power control operation to the instruction program based upon the detection result of the power control information analyzer (col. 5, lines 39-43 "In the step 805, an instruction to lower the clock frequency of the hardware resource is inserted");

23. Nishiyama does not disclose reassembling the instruction program in such a manner that the instruction section is made long.

24. Lin teaches an instruction reassembling unit, which reassembles the instruction program in such a manner that an instruction section is made long, during which an actuation of an operation resource can be stopped (col. 11, lines 25-28 "an optimizing compiler 802 to order the machine code instructions in a way which maximizes the power saving").

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25. It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of Nishiyama and Lin because one of ordinary skill in the art would have been motivated to "maximize the power saving" (Lin, col. 11, lines 25-28).

26. **Regarding Claims 9 and 15:** The rejections of claims 8 and 14 are incorporated respectively; further Lin teaches:

the instruction reassembling unit corresponds to instruction rearranging unit which rearranges instructions while maintaining an instruction dependent relationship established in the instruction program (col. 11, lines 15-24 "This decoded information may take the form of data dependency information").

27. **Claims 10, 16 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,790,877 to Nishiyama et al. (Nishiyama) in view of US 5,453,401 to Lin (Lin) .**

28. **Regarding Claims 10 and 16:** The rejections of claims 8 and 14 are incorporated respectively; further the Nishiyama-Lin combination does not teach replacing one instruction contained in the instruction program with another instruction.

29. Terechko teaches replacing one instruction contained in the instruction program by a replaceable instruction having the same process result as that of the one

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instruction (par. [0068] "it may be desirable to remap registers to concentrate the registers within a reduced number of register banks").

Regarding Claims 17 and 18: These claims are addressed as appropriate with the rejections of claims 1-16.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Mitchell whose telephone number is (571) 272-3728. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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12/6/06


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